What is claimed is:

1. A proton-conducting polymer membrane wherein 1 to 40 parts by weight of ionomer/solid proton conductor is dispersed in 100 parts by weight of proton-conducting polymer having proton-exchanging groups in side chain.

2. The proton-conducting polymer membrane of Claim 1, wherein said proton-exchanging group is selected from the group consisting of sulfonic acid, carboxylic acid, phosphoric acid, phosphonic acid and derivatives thereof.

3. The proton-conducting polymer membrane of Claim 1, wherein sulfoalkyl or sulfoaryl groups are inserted in metal phosphate layers of said ionomer/solid proton conductor.

4. The proton-conducting polymer membrane of Claim 3, wherein said metal is a group IV metal.

5. The proton-conducting polymer membrane of Claim 3, wherein said ionomer/solid proton conductor is a compound selected from the group consisting of compounds represented by the following Chemical Formula 1:

Chemical Formula 1

$M(O_3PCH_3)_2$, $M(O_3PCH_2OH)_2 \cdot H_2O$, $M(O_3PCH_2COOH)_2$, $M(O_3P(CH_2)_4COOH)_2$, $M(O_3P(CH_2)_5COOH)_2$, $M(O_3PCH_2SO_3H)_2$, $M(O_3P(CH_2)_2SO_3H)_2$, $M(O_3POH)(O_3PC_2H_4COOH) \cdot nH_2O$, $M(O_3POH)_x(O_3PC_2H_4COOH)_y \cdot nH_2O$, $M(O_3POH)_x(O_3PC_2H_4COOH)_y$,

$M(O_3PC_2H_5)_x(O_3PC_6H_4SO_3H)_y \cdot nH_2O$, $M(O_3CH_2OH)_x(O_3PC_6H_4SO_3H)_y \cdot nH_2O$

wherein M is a group IV element selected from Zr, Ti, Ce, Th and Sn; x + y = 2; and n is a real number in the range from 0 to 20.

6. The proton-conducting polymer membrane of Claim 1, wherein said proton-conducting polymer membrane has a thickness ranging from 30 to 125 μm.

7. A method of preparing a proton-conducting polymer membrane comprising the steps of:

1) dissolving a proton-conducting polymer having proton-exchanging groups in side chain in an organic solvent to prepare a 5 to 10 wt% proton-conducting polymer solution;

2) dispersing a ionomer/solid proton conductor in an organic solvent to prepare a 5 to 10 wt% ionomer/solid proton conductor solution;

3) mixing said proton-conducting polymer solution and said ionomer/solid proton conductor solution, so that 100 parts by weight of proton-conducting polymer is mixed with 1 to 40 parts by weight of ionomer/solid proton conductor; and

4) preparing a polymer membrane using said mixture solution.

8. The method of preparing a proton-conducting polymer membrane of Claim 7, wherein said organic solvent is one or more compounds selected from the group consisting of N-methyl-2-pyrrolidinone (NMP), dimethylformamide (DMF), dimethylacetamide (DMA), tetrahydrofuran (THF), dimethylsulfoxide (DMSO), acetone, methyl ethyl ketone (MEK), tetramethylurea, trimethylphosphate,

butyrolactone, isophorone, carbitol acetate, methylisobutylketone, *n*-butyl acetate, cyclohexanone, diacetone alcohol, diisobutyl ketone, ethyl acetoacetate, glycol ether, propylene carbonate, ethylene carbonate, dimethylcarbonate and diethyl carbonate.

9. A membrane-electrode assembly using the proton-conducting polymer membrane of any one of Claims 1 to 6.

10. A fuel cell containing the membrane-electrode assembly of Claim 9.